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LICENCE CONDITIONS HANDBOOK

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CHALK RIVER LABORATORIES NUCLEAR RESEARCH AND TEST ESTABLISHMENT OPERATING LICENCE

NRTEOL-01.00/2028

Revision 0



**Licence Conditions Handbook
(NRTEOL-LCH-01.00/2028,
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Effective: May 08, 2018

**Chalk River Laboratories Nuclear Research and Test
Establishment Operating Licence
NRTEOL-01.00/2028 (Effective: April 01, 2018)**

SIGNED at OTTAWA this 8th day of May, 2018



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INTRODUCTION

The general purpose of the Licence Conditions Handbook (LCH) is to identify and clarify the relevant parts of the licensing basis for each licence condition. This will help ensure that the licensee performs the licensed activities at the Chalk River Laboratories (CRL) in accordance with the licensing basis for CRL and the intent of the CRL licence. The LCH should be read in conjunction with the licence.

The LCH typically has three parts under each licence condition: the Preamble, Compliance Verification Criteria (CVC), and Guidance. The Preamble explains, as needed, the regulatory context, background, and/or history related to the licence condition. CVC are criteria used by CNSC staff to verify and oversee compliance with the licence condition. Guidance is non-mandatory information, including direction, on how to comply with the licence condition.

The documents referenced in the LCH by e-Access numbers are not publicly available. The links provided in the LCH are references to the internal CNSC electronic filing system, and those documents cannot be opened from outside of the CNSC network.

Current versions of the licensing basis publications, licensee documents that require notification of change, and guidance documents referenced in the LCH are tracked in the document *Licensing Documents for Chalk River Laboratories-CRL-Specific* (e-Doc [5507949](#)) and *-Company-Wide* (e-Doc [5507946](#)), which are controlled by the Nuclear Laboratories and Research Division and are available to the licensee upon request.

Most CNSC documents referenced in the LCH are available through the CNSC public website.

Documents listed on the CNSC website may contain prescribed information as defined by the *General Nuclear Safety and Control Regulations*. Information in these documents will be made available only to stakeholders with appropriate security clearance on a valid need to know.

The licensee documents referenced in the LCH are not publicly available; they contain proprietary information or prescribed information as defined by the *General Nuclear Safety and Control Regulations*.

Domestic and international standards (in particular consensus standards produced by the CSA Group) are an important component of the CNSC's regulatory framework. Standards support the regulatory requirements established through the *Nuclear Safety and Control Act* (NSCA), its regulations and licences by setting out the necessary elements for acceptable design and performance at a regulated facility or a regulated activity. Standards are one of the tools used by the CNSC to evaluate whether licensees are qualified to carry out licensed activities.

The CNSC offers complimentary access to the CSA Group [suite of nuclear standards](#) through the CNSC website. This access platform allows interested stakeholders to view these standards online through any device that can access the Internet.

Up to date lists of the nuclear and support facilities at CRL that are subject to CNSC regulatory oversight, and legacy facilities that were placed under care and maintenance or undergoing decommissioning under buildings removal plans, are maintained in the CNL document 900-514300-LST-001, *Site Licences, Certificates, Permits, Facilities and Representatives*.

Appendix A to the LCH provides definitions of terms and a list of acronyms used throughout it.

More information on the LCH is available in the CNSC document titled *How to Write a Licence Conditions Handbook* (LCH) (e-Doc [4967591](#)).

G. GENERAL

Licence Condition G.1: Licensing Basis

The licensee shall conduct the activities described in Part IV of this licence in accordance with the licensing basis, defined as:

- (i) the regulatory requirements set out in the applicable laws and regulations;
- (ii) the conditions and safety and control measures described in the facility's or activity's licence and the documents directly referenced in that licence; and
- (iii) the safety and control measures described in the licence application and the documents needed to support that licence application;

unless otherwise approved in writing by the Canadian Nuclear Safety Commission (hereinafter "the Commission").

Preamble:

The licensing basis sets the boundary conditions for acceptable performance at a regulated facility or activity, and thus establishes the basis for the CNSC's compliance program in respect of that regulated facility or activity. The degree to which the regulatory requirements are applied to CRL facilities and activities should reflect their importance to health and safety of persons, environment, national security, international obligations to which Canada has agreed, licensee's quality and economic expectations, the complexity of facility or activity, and the possible consequences if accidents occur or the activity is carried out incorrectly.

Where the licence condition requires the licensee to implement and maintain a particular program, the licensee documents that describe and implement the program are part of the licensing basis. Programs required by licence conditions or referred to in the LCH may or may not be health, safety, security, environment, and quality programs as defined in the Canadian Nuclear Laboratories Ltd. (CNL)'s management system.

Compliance Verification Criteria:

Part (i) of the Licensing Basis

Part (i) of the licensing basis refers to applicable laws and regulations. There are many federal and provincial acts and regulations, and international laws, agreements, guidelines, etc., applicable to activities performed at CRL.

The laws, regulations and international agreements for which CNSC has a regulatory role are:

- *Nuclear Safety and Control Act (NSCA) and its regulations;*
- *Canadian Environmental Assessment Act, 2012 (CEAA, 2012) and its regulations;*
- *Transportation of Dangerous Goods Act and its regulations;*
- *Canada Labour Code and Canada Occupational Health and Safety Regulations;*
- *Nuclear Liability and Compensation Act and its regulations;*
- *Fisheries Act (CNSC responsibilities are defined in the Memorandum of Understanding between the CNSC and Fisheries and Oceans Canada); and*
- *Canada/IAEA safeguards agreements.*

Through its decision of October 22, 2014, the Commission, pursuant to section 7 of the NSCA, exempted CNL from the requirements of sections 15.01 and 15.02 of the CNSC *Class II Nuclear Facilities and Prescribed Equipment Regulations* in relation to the requirement for a certified radiation safety officer (e-Doc [4543516](#)).

Part (ii) of the Licensing Basis

Part (ii) of the licensing basis refers to the conditions and the safety and control measures included in the CRL licence and in the documents directly referenced in the licence.

Under the standardized format and content, the CRL licence requires the licensee to implement and maintain certain programs. There are no documents directly referenced in the standardized CRL licence. For the purpose of licence requirement, a program may be a series of documented, coordinated activities, not necessarily a single document.

Part (iii) of the Licensing Basis

Part (iii) of the licensing basis refers to the safety and control measures described in the licence application and the documents needed to support that licence application. The safety and control measures include important aspects of that documentation such as, but not limited to: the facility-specific design basis and operational information documented in the most recent safety analysis and operational limits and conditions documents.

Part (iii) of the licensing basis also includes safety and control measures outlined in CNSC regulatory documents, CSA standards, and other standards, codes and references that are cited in the application or in the licensee's supporting documentation.

Applicable licensee documents are listed in the LCH under the heading "Licensee Documents that Require Notification of Change". Applicable CNSC regulatory documents, CSA standards and other documents are listed in the LCH under the heading "Licensing Basis Publications". The licensee documents listed in the LCH could cite other documents that also contain safety and control measures (i.e., there may be safety and control measures in "nested" references in the application). The licensee documents listed in the LCH and their "nested" references define the licensing basis for the programs required by the CRL licence as long as they include safety and control measures.

Regulatory Role of the Licensing Basis

The licensing basis is established when the Commission renders its decision regarding the licence application.

Licence condition G.1 requires the licensee to conduct the licensed activities in accordance with the licensing basis. For activities that are not in accordance with the licensing basis, the licensee shall take action as soon as practicable to return to a state consistent with the licensing basis, taking into account the risk significance of the situation.

The applicability of the licensing basis publications may be graded based on the specific of facility/activity being considered.

CNSC Staff's Approach to Assessing the Licensing Basis for CRL

For any proposed activity/facility to be carried out on the CRL site, CNSC staff will review the information submitted by CNL to determine if the proposed activity/facility remains within the licensing basis. CNL may proceed with the proposed initiatives if they are found to be within the licensing basis.

CNSC staff assess a proposed facility/activity as being within the licensing basis based on the hazard and risk of the change, and its impact on the overall safety of the CRL site.

CNSC staff will submit to the Commission for consideration any proposed activity or facility which CNSC staff consider to be outside the licensing basis. If the Commission grants approval to such an

activity/facility, this activity/facility will become part of the licensing basis for CRL and reflected in updates to LCH as appropriate.

Activities Included in the CRL Licensing Basis

Conduct of licensed activities at CRL includes:

- (a) Operate, wholly or in part, any facility/building at CRL.
- (b) Carry out site preparation, construction, or construction modification, or undertakings that are required for, associated with, or arise from the conduct of licensed activities at CRL.
- (c) Construct, modify or abandon any facility/building at CRL.
- (d) Transition from operation to an extended or permanent safe shutdown state any facility/building at CRL, or any parts thereof.
- (e) Maintain in safe shutdown state (extended or permanent) any facility/building at CRL, or any parts thereof.
- (f) Transition from operation or from safe shutdown state to decommissioning any facility/building at CRL, or any parts thereof.
- (g) Decommission/demolish any facility/building at CRL, or any parts thereof.
- (h) Release any decommissioned/demolished facility/building from CNSC regulatory control.
- (i) Produce, possess, process, refine, transfer, use, package, manage, store, dispose or abandon nuclear substances.
- (j) Produce, possess, use, service, transfer or abandon prescribed equipment.
- (k) Produce, possess, use, transfer or abandon prescribed information.
- (l) Process, store or dispose of waste received from offsite clients.
- (m) Receive, repair, modify, store and return contaminated equipment from offsite clients.

Class I and Class II nuclear facilities at CRL are listed below. A complete list of all nuclear facilities at CRL is found in 900-514300-LST-001, "Site Licences, Certificates, Permits, Facilities and Representatives".

Class I Nuclear Facilities	Class II Nuclear Facilities
National Research Universal (NRU) Reactor	Health Physics Neutron Generator
Nuclear Fuel Fabrication Facility (NFFF), Building 405	Gamma Beam Irradiation Facility
Nuclear Fuel Fabrication Facility (NFFF), Buildings 429A & 429B	Gamma Beam Irradiator
Recycle Fuel Fabrication Laboratories (RFFL)	Van de Graaff Electron Accelerator
ZED-2 Reactor	
Universal Cells	
Molybdenum-99 Production Facility	
Tritium Laboratory	
Waste Treatment Centre and Associated Facilities	
Fuels and Materials Cells	
Waste Management Areas	
Combined Electrolysis and Catalytic Exchange Upgrading and Detritiation Test Facility	

Licence Application Documents and Supporting Documents

Document Number	Document Title	e-Doc
CRL-CNNO-17-0005-L	Application for Renewal of the Nuclear Research and Test Establishment Operating Licence for the Chalk River Laboratories – 2018	5507949
CRL-CNNO-17-0010-L	Application for Renewal of the Nuclear Research and Test Establishment Operating Licence for the Chalk River Laboratories – 2018 (Supporting Information for CNSC Staff)	5507949
CRL-CNNO-17-0017-L	Implementation of REGDOCs and CSA Standards in Support of Relicensing	5507949

Guidance:

Guidance Documents

Document Number	Document Title	Version
INFO-0795	Licensing Basis Objectives and Definition	2010

When the licensee becomes aware that a proposed change or activity might be outside the licensing basis, it should first seek direction from CNSC staff regarding the potential acceptability of this change or activity. The licensee should take into account that certain types of proposed changes might require significant lead times before CNSC staff can make recommendations and/or the Commission can properly consider them.

Licence Condition G.2: Notification of Changes

The licensee shall give written notification of changes to the facility or its operation, including deviation from design, operating conditions, policies, programs and methods referred to in the licensing basis.

Preamble:

Most changes to the CRL site and its facilities are captured as changes to corresponding licensee's documents. The LCH identifies licensee documents that require written notification of changes to the CNSC.

Compliance Verification Criteria:

The licensee shall, as a minimum, notify CNSC staff of changes to licensee's documents identified in the LCH. The written notification of change shall include a copy of the revised document and a description of the change.

CNL program requirements documents (PRDs) and program description documents (PDDs) are accompanied by governing document indices (GDIs). The licensee shall provide updated versions of GDIs annually or upon request from CNSC.

Licensee documents listed in the LCH are subdivided into groups having different requirements for notification of change.

- PN prior notification - the licensee shall submit the notice to the CNSC prior to implementing the change; typically, the requirement is to submit the proposed changes 30 days prior to planned implementation; however the licensee shall allow sufficient time for the CNSC to review the change proportionate to its complexity and the importance of the safety and control measures being affected
- NT notification at time of making the change
- ACC CNSC staff acceptance of changes is required before proceeding with change

Changes that may affect the licensing basis, including any change that is not captured as a change to a document listed in the LCH (e.g., construction of new facilities/buildings, transitioning any facility/building from one phase of its life cycle to another, or infrastructure improvements at CRL), requires written notification to the CNSC to verify they are in accordance with the licensing basis.

For any change that is outside the licensing basis defined in subsection G.1 of the LCH, the licensee shall obtain Commission approval before proceeding with the change.

Guidance:

For proposed changes that would not be in accordance with the licensing basis, the guidance for licence condition G.1 applies.

Licence Condition G.3: Land Use and Occupation

The licensee shall control the use and occupation of any land within the exclusion zone.

Preamble:

The initial description of CRL property was included in the Schedule to the Atomic Energy Control Board (AECB) Order 1/14/74, dated June 4, 1974, and published in Part I of the Canada Gazette for June 8, 1974, which designated CRL as a protected site. As the concept of exclusion zone for CRL was not defined in AECB Order 1/14/74, for the purpose of this licence condition the exclusion zone is interpreted as the entire CRL site comprising the controlled area and the supervised area.

The current legal description of the CRL property is included in the Ontario Land Registry under the PINs 57075-0003(LT), 57074-021(LT) and 57076-0049(LT).

Compliance Verification Criteria:

The licensee shall control land use and occupation such that no permanent dwelling (house, residence) is permitted within the supervised or controlled areas at the CRL site.

Permanent dwelling refers to housing that is meant to be fixed. The licensee may erect, for a short time without prior notification, temporary structures required for operational purposes (e.g., a trailer).

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
E-4500-1101	CRL Outer Area Plant Boundary Monuments Property Plan	5507949	NT

Guidance:

None provided.

Licence Condition G.4: Office Space for Onsite CNSC Staff

The licensee shall provide, at the nuclear facility and at no expense to the Commission, suitable office space for employees of the Commission who customarily carry out their functions on the premises of that nuclear facility.

Preamble:

CNSC staff require suitable office space and equipment at the CRL site in order to satisfactorily carry out their regulatory activities.

Compliance Verification Criteria:

The licensee shall keep the office space of onsite CNSC staff secured and separated from the remainder of the building in which it is located by walls, partitions or other suitable structures.

Guidance:

Any changes to accommodation or equipment provided to onsite CNSC staff should be made based on discussion, and subsequent arrangement, between the CNSC and the licensee. The licensee should provide access to its intranet through licensee-owned computers installed in the CNSC site office at CRL.

Licence Condition G.5: Financial Guarantee

The licensee shall maintain a financial guarantee for decommissioning that is acceptable to the Commission.

Preamble:

Atomic Energy of Canada Limited (AECL) is a Schedule III, Part 1 Crown Corporation under the *Financial Administration Act* and an agent of Her Majesty in Right of Canada. As an agent of Her Majesty in Right of Canada, AECL's liabilities are ultimately liabilities of Her Majesty in Right of Canada. While the restructuring of AECL has seen the ownership of Canadian Nuclear Laboratories Limited (CNL) transferred to a private-sector contractor, the Canadian Nuclear Energy Alliance (CNEA), AECL retains ownership of the lands, assets and liabilities associated with CNL's licences. These liabilities have been officially recognized by the Minister of Natural Resources in a letter dated July 31, 2015 (e-Doc [4803454](#), [4815508](#)).

Compliance Verification Criteria:

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
146-508810-REPT-036	General Report – 2013 Basis of Cost Estimate: Chalk River Laboratories Decommissioning Liability	5507949	NT

Guidance:

Guidance Documents

Document Number	Document Title	Version
G-206	Financial Guarantee for the Decommissioning of Licensed Activities	2000

Licence Condition G.6: Public Information and Disclosure Program

The licensee shall implement and maintain a public information and disclosure program.

Preamble:

Class I Nuclear Facilities Regulations require that an application for a licence shall contain the proposed program to inform persons living in the vicinity of the site of the general nature and characteristics of the anticipated effects on the environment and the health and safety of persons that may result from the activity to be licensed.

Class II Nuclear Facilities and Prescribed Equipment Regulations require that an application for a licence shall contain the program to inform persons living in the vicinity of the site of the general nature and characteristics of the anticipated effects on the environment and the health and safety of persons that may result from the nuclear facility.

This licence condition requires the licensee to implement and maintain a public information and disclosure program to improve the public's level of understanding about CRL's facilities and activities.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
RD/GD-99.3	Public Information and Disclosure	2012	April 1, 2018

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
CW-513430-REPT-001	Public Information Program for Canadian Nuclear Laboratories (CNL)	5507946	NT

Guidance:

None provided.

SCA – MANAGEMENT SYSTEM

Licence Condition 1.1: Management System

The licensee shall implement and maintain a management system.

Preamble:

Safe and reliable operation of nuclear facilities requires a commitment and adherence to a set of management system principles and, consistent with those principles, the implementation of planned and systematic processes that achieve expected results. The management system focuses on safety in all business activities and supports the safe conduct of licensed activities at CRL.

The *Class I Nuclear Facilities Regulations* require that an application for a licence shall contain the proposed management system for the activity to be licensed, including measures to promote and support safety culture.

The *General Nuclear Safety and Control Regulations* require that a licence application contain the applicant's organizational management structure, including the internal allocation of functions, responsibilities and authority.

The management system is in place to satisfy the requirements set out in the NSCA, regulations made pursuant to the NSCA, the licence and the measures necessary to ensure that safety is of paramount consideration in the implementation of the management system. The management system promotes and supports a healthy safety culture by integrating the characteristics of a healthy safety culture:

- Safety is a clearly recognized value;
- Accountability for safety is clear;
- Safety is integrated into all activities;
- A safety leadership process exists; and
- Safety culture is learning driven

CSA standard N286 contains the requirements for a management system throughout the life cycle of a nuclear facility and extends to all safety and control areas.

CSA standard N286.0.1 provides background information concerning certain clauses and requirements in CSA N286. This background information can help the user clarify the context of the CSA N286 requirements.

CSA standard N286.10 provides requirements and guidance to be applied for the development and implementation of configuration management at high energy reactor facilities (more than 10 MWth power) so that consistency between design requirements (including safety analysis), physical and operational configuration, and configuration information (e.g., operating procedures or drawings) can be achieved and maintained.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
CSA N286	Management system requirements for nuclear facilities	2012 (R2017)	April 1, 2018

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
900-514100-MAN-001	Management System	5507946	PN
900-514200-MAN-001	Quality Assurance	5507946	NT
900-514100-LST-001	Functional Authorities	5507946	NT
900-514300-LST-001	Site Licences, Certificates, Permits, Facilities and Representatives	5507946	NT
900-502000-LST-001	Program Management Authorities	5507946	NT
900-513000-LST-001	Codes, Regulations, Standards, and other Documents	5507946	NT

Guidance:

Guidance Documents

Document Number	Document Title	Version
CSA N286.0.1	Commentary on N286-12, Management system requirements for nuclear facilities	2014
CSA N286.10	Configuration management for high energy reactor facilities	2016

SCA – HUMAN PERFORMANCE MANAGEMENT

Licence Condition 2.1: Human Performance Program

The licensee shall implement and maintain a human performance program.

Preamble:

Human performance is the outcome of human behaviours, functions and actions in a specified environment, reflecting the ability of workers and management to meet the system's defined performance under the conditions in which the system will be employed.

Human factors are factors that influence human performance as it relates to the safety of a nuclear facility or activity over all the phases, including design, operation, maintenance, and decommissioning. These factors may include the characteristics of the person, task, equipment, organization, environment, and training. The application of human factors to issues such as interface design, training, procedures, organization and job design may affect the reliability of humans performing tasks under various conditions.

The human performance program addresses and integrates the range of human factors that influence human performance, including but not limited to:

- The provision of qualified workers;
- The reduction of human error;
- Organizational support for safe work activities;
- The continuous improvement of human performance; and
- Monitoring hours of work.

The *General Nuclear Safety and Control Regulations* require the licensee to: ensure the presence of sufficient number of qualified staff; train the workers; and ensure the workers follow procedures and safe work practices.

The *Class I Nuclear Facilities Regulations* require that an application for a licence shall contain the proposed human performance program for the activity to be licensed, including measures ensure workers fitness for duty.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.2.4	Fitness for Duty: Managing Worker Fatigue	2017	April 1, 2019
RD-363	Nuclear Security Officer Medical, Physical, and Psychological Fitness	2008	April 1, 2018
REGDOC-2.2.4	Fitness for Duty, Volume II: Managing Alcohol and Drug Use, version 2	2017	December 1, 2019

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
900-514000-PDD-001	Performance Assurance	5507946	NT
900-514000-PRD-001	Performance Assurance	5507946	PN

Guidance:

Guidance Documents

Document Number	Document Title	Version
G-323	Ensuring Presence of Sufficient Qualified Staff at Class I Nuclear Facilities: Minimum Staff Complement	2007

Licence Condition 2.2: Training Program

The licensee shall implement and maintain a training program.

Preamble:

This licence condition requires the licensee to develop and implement training programs for workers.

It also provides the requirements regarding the program and processes necessary to support responsibilities of, qualifications and requalification training of persons at the nuclear facility.

As defined by the *General Nuclear Safety and Control Regulations*, a worker is a person who performs work that is referred to in a licence. This includes contractors and temporary employees. Training requirements apply equally to these types of workers as to the licensee's own employees.

The *General Nuclear Safety and Control Regulations* require that licensees ensure that there are a sufficient number of properly trained and qualified workers to safely conduct the licensed activities.

The *Class I Nuclear Facilities Regulations* require that applicants for a Class I facility licence describe the training programs which have been implemented, and that licence applications include the proposed responsibilities, qualification requirements, training program and requalification program for workers; along with the results that have been achieved in implementing the program for recruiting, training and qualifying workers.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.2.2	Personnel Training, version 2	2016	April 1, 2018

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
900-510200-PDD-001	Training and Development	5507946	NT
900-510200-PRD-001	Training and Development	5507946	PN

The licensee shall ensure that all workers are qualified to perform the duties and tasks required of their position.

Guidance:

None provided.

Licence Condition 2.3: Staffing and Certification

Persons appointed to the following positions shall be certified

- (a) Senior Reactor Shift Engineer; and
- (b) NRU Health Physicist.

Preamble:

This condition requires that any person that the licensee appoints to the positions of Senior Reactor Shift Engineer or NRU Health Physicist must hold a certification issued pursuant to the NSCA. In addition, the certified persons must maintain their competency through continuing training and experience carrying out the duties of the position for which they have been certified.

Compliance Verification Criteria:

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
NRU-510000-REQ-001	SRSE Roles and Responsibilities	5507949	NT
NRU-510000-REQ-002	NRU HP Roles and Responsibilities	5507949	NT

The licensee shall ensure persons appointed to the position of Senior Reactor Shift Engineer (SRSE) at NRU or NRU Health Physicist (NRU HP) hold a certification for the position to which they have been appointed, in accordance with the requirements of the *Class I Nuclear Facilities Regulations*.

The licensee shall ensure that each certified SRSE and NRU HP perform the duties of their certified position in accordance with the approved Roles and Responsibilities documents for these positions.

Any person appointed to the position of SRSE or NRU HP shall only delegate the authorities or responsibilities of their position to another person who holds a certification issued pursuant to the NSCA for the same position.

- When applying for certification or renewal of certification of a person as SRSE or NRU HP, the licensee shall meet the requirements specified by CNSC staff (e-Doc [5390788](#)).
- The licensee shall ensure that certified SRSEs and NRU HPs complete the continuing training requirements, complete the requalification tests and perform the duties of the position for the minimum time as specified by CNSC staff (e-Doc [5390788](#)).
- The licensee shall immediately remove a person from the duties of SRSE or NRU HP under any of the conditions specified by CNSC staff (e-Doc [5390788](#)).

Guidance:

None provided.

SCA – OPERATING PERFORMANCE

Licence Condition 3.1: Operating Program

The licensee shall implement and maintain an operating program, which includes a set of operating limits.

Preamble:

The *Class I Nuclear Facilities Regulations* require that a licence application contain the proposed measures, policies, methods and procedures for safely operating and maintaining the nuclear facility.

The operational limits and conditions for CRL facilities are currently documented in

- facility authorizations documents (for Class I and Class II nuclear facilities);
- MAPLE Reactors operational limits and conditions;
- NPF operational limits and conditions; and
- laboratory protocols, criticality safety documents and other documents for other workplaces where operations with fissionable materials are performed involving handling, use, processing, movement and storage.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.3.1	Conduct of Licensed Activities: Construction and Commissioning Programs	2016	April 1, 2018
REGDOC-2.3.2	Accident Management, Version 2	2015	April 1, 2018

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
900-508200-PDD-001	Conduct of Operations	5507946	NT
900-508200-PRD-001	Conduct of Operations	5507946	PN
900-505240-PDD-001	Construction	5507946	NT
900-505240-PRD-001	Construction	5507946	PN
900-505250-PDD-001	Commissioning	5507946	NT
900-505250-PRD-001	Commissioning	5507946	PN
See e-Doc 5507949	Facility Authorizations	5507949	PN ¹
See e-Doc 5507949	Storage with Surveillance Plans	5507949	NT ¹

¹ Notification is required only for non-administrative changes. Otherwise, the licensee shall provide updated facility authorizations and storage-with-surveillance plans to CNSC staff quarterly.

REGDOC-2.3.1, *Conduct of Licensed Activities: Construction and Commissioning Programs*, is only applicable to reactor facilities.

REGDOC-2.3.2, *Accident Management*, Version 2 describes requirements related to Emergency Operating Procedures (EOP) and Severe Accident Management Guidelines (SAMG) and is only applicable to the NRU Reactor.

CRL Facilities Operations

The operational limits and conditions shall define the conditions that must be met to prevent situations or events that might lead to accidents, or to mitigate the consequences of accidents should they occur. The updated operational limits and conditions shall be based on safety analyses.

Limits and conditions for normal operation shall include limits on operating parameters, stipulation for minimum amount of operable equipment, actions to be taken by the operating staff in the event of deviations from the operational limits and conditions, and the time allowed for completing these actions.

The licensee shall review, revise and reissue as appropriate the operational limits and conditions when required due to changes in technologies, regulations, operational information or physical configuration.

Construction and operation of New Nuclear Facilities

The licensee may construct or install facilities, buildings, structures, components or equipment only if that construction or installation is compliant with the licensing basis.

The Commission has delegated to the DG-DNCFR the authority to approve the documents necessary to allow the construction and operation of Shielded Modular Above-Ground Storage Buildings (SMAGS) (e-Doc [3052093](#), [3530785](#), [3284667](#) and [3316267](#)).

The licensee shall submit the design requirements documents for DG-DNCFR acceptance prior to the construction of any new Shielded Modular Above-Ground Storage Buildings (SMAGS).

The licensee shall submit the commissioning report for DG-DNCFR acceptance prior to the operation of any new SMAGS Buildings.

Facilities in Safe Shutdown State

The licensee shall develop and maintain storage-with-surveillance plans (SWS plans) for Class I and Class II nuclear facilities in permanent safe shutdown state. The licensee shall maintain those facilities in permanent safe shutdown state according to the SWS plan for the facility.

Facilities under Decommissioning

See subsection 11.2 for details regarding the decommissioning of individual facilities at CRL.

Release from Regulatory Control

See Subsection 11.2 for details regarding the release from regulatory control of individual facilities at CRL.

Modifications to Facilities and Processes

The licensee shall ensure that modifications to CRL facilities do not negatively impact safe operation of the facility. The licensee shall define the process for making permanent or temporary modifications to operational limits and conditions. Such modifications shall be justified by analyses and safety reviews.

The licensee may only modify facilities, buildings, structures, components or equipment in compliance with the licensing basis.

The licensee shall ensure that:

- (a) all temporary modifications are identified at the point of application and at any relevant control positions;

- (b) operating personnel are informed of any modifications and their consequences for facility operations;
- (c) the temporary modifications are reviewed and approved before installation; the review shall be documented to demonstrate the scope and conclusion of the review;
- (d) the number of simultaneous temporary modifications is kept to a minimum;
- (e) the duration of temporary modifications is limited and specified prior to implementation;
- (f) testing is performed after installation and removal of the temporary modification;
- (g) temporary modifications are shown on affected documents; and
- (h) the facility is returned to the original state when the temporary modification is no longer needed.

Sealed Sources

The licensee shall ensure the sealed sources are controlled (by maintaining an inventory of sealed sources, and tracking and reporting their transfer) in order to achieve the objectives of IAEA's *Code of Conduct on the Safety and Security of Radioactive Sources*.

The inventory of sealed sources shall contain all sealed sources, both in use and in storage, of any category of sources as defined by IAEA safety guide RS-G-1.9 *Categorization of Radioactive Sources*. The licensee shall provide details of their inventory at the CNSC staff's request.

Unless otherwise permitted by the prior approval of the CNSC, the licensee shall, in respect of a radioactive nuclear substance set out in column 1 of the table 3-1, report in writing to the CNSC staff any transfer or receipt of a sealed source whose corresponding activity is equal to or greater than the value set out in column 2 of the table:

- (a) at least seven business days before any transfer, and
- (b) within two business days of any receipt of a transfer.

Table 3-1: Activity Limits for Reporting the Transfer of Sealed Sources

Column 1	Column 2
Nuclear Substance	(TBq)
Americium 241	0.6
Americium 241/Beryllium	0.6
Californium 252	0.2
Curium 244	0.5
Cobalt 60	0.3
Cesium 137	1
Gadolinium 153	10
Iridium 192	0.8
Promethium 147	400
Plutonium 238	0.6
Plutonium 239/Beryllium	0.6
Radium 226	0.4
Selenium 75	2
Strontium 90 (Yttrium 90)	10

Column 1	Column 2
Nuclear Substance	(TBq)
Thulium 170	200
Ytterbium 169	3

The written report shall be in a form acceptable to the CNSC staff and shall include:

1. on transfer of a sealed source(s),
 - (a) the date of transfer,
 - (b) the name of the recipient and licence number,
 - (c) the address of the recipient's authorized location,
 - (d) the nuclear substance (radionuclide),
 - (e) activity (radioactivity) (Bq) per sealed source on the reference date,
 - (f) the reference date,
 - (g) the number of sealed source(s),
 - (h) the aggregate activity (Bq),
 - (i) the sealed source unique identifiers (if available), and
 - (j) where the sealed source is incorporated in prescribed equipment,
 - (i) the name and model number of the equipment, and
 - (ii) the equipment serial number (if available);
2. on receipt of a sealed source(s),
 - (a) the date of receipt of a transfer,
 - (b) the name of the shipper and licence number,
 - (c) the address of the shipper's authorized location,
 - (d) the nuclear substance (radionuclide),
 - (e) activity (radioactivity) (Bq) per sealed source on the reference date,
 - (f) the reference date,
 - (g) the number of sealed source(s),
 - (h) the aggregate activity (Bq),
 - (i) the sealed source unique identifiers (if available), and
 - (j) where the sealed source is incorporated in prescribed equipment,
 - (i) the name and model number of the equipment, and
 - (ii) the equipment serial number (if available).

In this subsection, "transfer" means movement of sealed sources from CRL to locations outside CRL site, or from locations outside CRL site to CRL. It does not include the movement of sealed sources between various CRL facilities/locations.

Guidance:

Facilities in Safe Shutdown State

Typical steps taken to transition the facility from operation to a permanent safe shutdown state are:

During the Operational Phase

1. The licensee defines and documents the activities needed to transition the facility from operation to a permanent safe shutdown state.

2. The licensee prepares the SWS plans.
3. The licensee submits the documentation prepared during steps 1 and 2 to CNSC staff.

During the Transition Phase

4. The licensee performs the activities needed to put the facility in a long-term safe shutdown state, updates the SWS plans, and resubmit to CNSC staff if needed.

During the Permanent Safe Shutdown State

5. The licensee carries out actions as documented in the SWS plans.

Modifications to Facilities and Processes

The licensee should review outstanding temporary modifications to determine whether they are still needed.

Licence Condition 3.2: Reporting Requirements

The licensee shall implement and maintain a program for reporting to the Commission or a person authorized by the Commission.

Preamble:

This licence condition sets the requirements for reporting information to CNSC, including compliance monitoring and operational performance, event reporting, and various types of notifications.

Many reportable occurrences included in REGDOC-3.1.2 do not necessarily show a degradation of licensee's performance, and do not fall under CNSC definition of a "reportable event" as included in REGDOC-3.6 Glossary of CNSC Terminology. An exercise of judgment is needed to select from all occurrences reported to CNSC those that really constitute "reportable events".

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-3.1.2	Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills	2018	January 1, 2019

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
CW-508760-PRO-001	Canadian Nuclear Laboratories Reporting of Unplanned Events and Situations to the Canadian Nuclear Safety Commission	5507946	NT

Compliance Monitoring: Annual Reporting

The licensee shall prepare and submit to the CNSC staff, at the intervals specified below, written reports that cover

- the operation and maintenance of the facilities listed in subsections 5.1.1 to 5.1.6 of CNL document 900-514300-LST-001, *Site Licences, Certificates, Permits, Facilities and Representatives*, summarizing facility and equipment performance and changes, changes to operating policies, changes in organization, personnel radiation exposures, releases of nuclear substances from the facilities, and releases of hazardous substances from the facilities;
- the status of the facilities listed in subsections 5.1.7 and 5.1.8 of CNL document 900-514300-LST-001, *Site Licences, Certificates, Permits, Facilities and Representatives*, summarizing facility and equipment performance and changes, changes to operating policies, changes in organization, personnel radiation exposures, releases of nuclear substances from the facilities, and releases of hazardous substances from the facilities;
- changes to the emergency authorities and organization, updates or changes to the radiation emergency procedures, status of and changes in other program documentation, training activities, drill and exercise activities, status of emergency resources and facilities, interactions with outside agencies, and unplanned events that tested the emergency response organization;
- the results of the effluent monitoring for radioactive nuclear substances, the effluent monitoring for hazardous substances, and personnel radiation exposures for CRL;

- (e) the results of environmental monitoring for nuclear substances and hazardous substances;
- (f) the evaluation of the adequacy of the existing or proposed physical protection system;
- (g) changes to security provisions;

The licensee shall, by April 30 of each calendar year, submit to the CNSC staff the reports described in criteria (a), (b), (c), (d), (f), and (g) covering the preceding calendar year.

The licensee shall, by June 30 of each calendar year, submit to the CNSC staff the reports described in criterion (e) of the LCH covering the preceding calendar year.

The licensee shall, by December 1 of each calendar year, submit to the CNSC staff the annual status report on environmental assessment follow-up actions covering the 12-month period up to and including the previous July 31.

Guidance:

Event Reporting

To encourage reporting of situations or events that may result in improvement actions, event reporting should not be used as a tool for assessing or measurement of nuclear safety, or as a basis for assessing the licensee's performance.

Compliance Monitoring: Annual Reporting

The annual reports should follow, where appropriate the format and content presented in Appendix B of REGDOC-3.1.2.

SCA – SAFETY ANALYSIS

Licence Condition 4.1: Safety Analysis Program

The licensee shall implement and maintain a safety analysis program.

Preamble:

All event sequences which can occur in a nuclear facility must be analyzed to ensure safe operation. A deterministic safety analysis evaluates the facility's responses to such events by using predetermined rules and assumptions. The objectives of the deterministic safety analysis are stated in REGDOC-2.4.1.

The *General Nuclear Safety and Control Regulations* require that a licence application contain a description and the results of any analyses performed.

The *Class I Nuclear Facilities Regulations* require, amongst other requirements, that an application for a licence to operate a Class I nuclear facility contains a final safety analysis report, and additional supporting information.

The licensee holds the responsibility for ensuring that the safety analysis is accurate and meets the regulatory requirements, and shall maintain adequate capability to perform or procure safety analysis and to train safety analysts.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.4.1	Deterministic Safety Analysis	2014	April 1, 2018

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
900-508770-PDD-001	Safety Analysis	5507946	NT
900-508770-PRD-001	Safety Analysis	5507946	PN
CRL-03510-SAB-001	CRL Site Characteristics	5507949	NT
See e-Doc 5507949	Safety Analyses	5507949	NT ¹

¹ Notification is required only for non-administrative changes. Otherwise, the licensee shall provide updated safety analyses to CNSC staff quarterly.

Part II and Appendix C of REGDOC-2.4.1 are applicable to research reactors at CRL. It may be used as guidance for performing the safety analysis for other CRL facilities.

Where probabilistic safety assessments (PSA) are performed, the licensee shall ensure that

- the limitations of the PSA are understood, recognized and taken into account in all its use, and the adequacy of a particular probabilistic safety assessment application is always checked with respect to these limitations;
- when the PSA is used for evaluating or changing the requirements on periodic testing and allowed outage time for a system or component, all relevant items, including states of the systems and components and safety functions they participate in, are included in the analysis; and
- the operability of components, that have been found by the PSA to be important to safety, is ensured and their role is recorded in the safety analysis report.

Guidance:

Guidance Documents

Document Number	Document Title	Version
REGDOC-2.4.2	Probabilistic Safety Assessment (PSA) for Nuclear Power Plants	2014
IAEA GSR Part 4, Rev. 1	Safety Assessment for Facilities and Activities	2016

Licence Condition 4.2: Nuclear Criticality Safety Program

The licensee shall implement and maintain a nuclear criticality safety program.

Preamble:

This licence condition requires the licensee to develop, implement and maintain a nuclear criticality safety program to ensure that the upper subcritical limits established in the criticality safety documents will not be exceeded under both normal and credible abnormal conditions (events or event sequences having the frequency of occurrence equal to or more than 10^{-6} /year) during operations with fissionable materials outside reactors.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
RD-327	Nuclear Criticality Safety	2010	April 1, 2018

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
900-508550-PDD-001	Nuclear Criticality Safety	5507946	NT
900-508550-PRD-001	Nuclear Criticality Safety	5507946	PN
See e-Doc 5507949	Criticality Safety Documents	5507949	NT ¹

¹ Notification is required only for non-administrative changes. Otherwise, the licensee shall provide updated criticality safety documents to CNSC staff quarterly.

For legacy activities or projects, the licensee may implement the requirements of the nuclear criticality safety on a graded approach with appropriate criteria for categorization according to their safety significance. The legacy items are those nuclear criticality safety related activities and projects where work has begun prior to November 1, 2011.

Guidance:

Guidance Documents

Document Number	Document Title	Version
GD-327	Guidance for Nuclear Criticality Safety	2010

SCA – PHYSICAL DESIGN

Licence Condition 5.1: Design Program

The licensee shall implement and maintain a design program.

Preamble:

The *Class I Nuclear Facilities Regulations* require that a licence application contain a description of the structures, systems and components, and relevant documentation of the facility design.

A design program ensures that the facility design is managed using a well-defined systematic approach.

Implementing and maintaining a design program confirms that safety-related SSCs and any modifications to them continue to meet their design bases given new information arising over time and taking changes in the external environment into account. It also confirms that SSCs continue to be able to perform their safety functions under all facility states. An important cross-cutting element of a design program is design basis management.

CSA standard N290.13 specifies the requirements for an environmental qualification program for CANDU nuclear power plants.

CSA standard N289.1 specifies the general requirements for seismic design and qualification of CANDU nuclear power plants.

CSA standard N289.2 describes the investigations required to obtain the seismological and geological information necessary to determine, for a proposed or existing nuclear power plant site, the seismic ground motion that will be used in seismic qualification of safety-related plant structures and systems, and the potential for seismically induced phenomena that can have a direct or indirect effect on plant safety or operation.

CSA standard N289.3 specifies the requirements, criteria, and methods of analysis for: (a) determining the design response spectra and ground motion time-histories to be used in the analysis; (b) establishing design criteria for SSCs, and supports that require seismic qualification; and (c) performing seismic analyses, including the effects of the soil-structure-interaction.

CSA standard N289.4 defines the processes and requirements for performing seismic qualification by testing and presents the test methods that may be used for the seismic qualification of the nuclear power plant SSCs.

CSA standard N289.5 specifies the requirements for seismic instrumentation systems for nuclear power plants and nuclear facilities to monitor site-specific seismic responses.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
RD-367	Design of Small Reactor Facilities	2011	April 1, 2018
REGDOC-2.5.7	Design, Testing and Performance of Exposure Devices	2017	April 1, 2018
	National Building Code of Canada	2015	April 1, 2018

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
900-508120-PDD-001	Design Authority and Design Engineering	5507946	NT
900-508120-PRD-001	Design Authority and Design Engineering	5507946	PN
900-508120-LST-001	Design Authorities	5507946	NT

RD-367 is only applicable to water-cooled small reactors less than 200MWth.

Guidance:

Guidance Documents

Document Number	Document Title	Version
REGDOC-2.5.2	Design of Reactor Facilities: Nuclear Power Plants	2014
G-276	Human Factors Engineering Program Plans	2003
G-278	Human Factors Verification and Validation Plans	2003
GD-52	Design Guide for Nuclear Substances Laboratories and Nuclear Medicine Rooms	2010
CSA N290.13	Environmental Qualification of Equipment for CANDU Nuclear Power Plants	2005 (R2015)
CSA N289.1	General requirements for seismic design and qualification of CANDU nuclear power plants	2008 (R2013)
CSA N289.2	Ground motion determination for seismic qualification of nuclear power plants	2010 (R2015)
CSA N289.3	Design procedures for seismic qualification of nuclear power plants	2010 (R2015)
CSA N289.4	Testing procedures for seismic qualification of nuclear power plant structures, systems, and components	2012 (R2017)
CSA N289.5	Seismic instrumentation requirements for nuclear power plants and nuclear facilities	2012 (R2017)

Licence Condition 5.2: Pressure Boundary Program and Authorized Inspection Agency

The licensee shall implement and maintain a pressure boundary program and shall have in place a formal agreement with an authorized inspection agency.

Preamble:

A pressure boundary program is comprised of the many programs, processes and procedures and associated controls that are required to ensure compliance with CSA standard N285.0, which defines the technical requirements for the design, procurement, fabrication, installation, modification, repair, replacement, testing, examination and inspection of pressure-retaining and containment systems, including their components and supports.

This licence condition also ensures that an authorized inspection agency (AIA) will be contracted directly by the licensee. An AIA is an organization recognized by the CNSC as authorized to register designs and procedures, perform inspections, and other functions and activities as defined by N285.0 and its applicable referenced publications (e.g. CSA standard B51 *Boiler, pressure vessel, and pressure piping code*). The AIA is accredited by the American Society of Mechanical Engineers (ASME) as stipulated by NCA-5121 of the *ASME Boiler & Pressure Vessel Code*.

CSA standard N285.0 specifies the technical requirements for the design, procurement, fabrication, installation, modification, repair, replacement, testing, examination and inspection of, and other work related to, pressure-retaining systems, components, and supports over the service life of a CANDU nuclear power plant.

CSA standard N285.0.1 provides background information concerning certain clauses and requirements in CSA N285.0. This background information can help the user clarify the context of the CSA N285.0 requirements.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Revision	Effective Date
CSA N285.0	General requirements for pressure-retaining system and components in CANDU nuclear power plants	2008	April 1, 2018
CSA N285.0	General requirements for pressure-retaining system and components in CANDU nuclear power plants	2017	April 1, 2020

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
900-508140-PDD-001	Pressure Boundary	5507946	NT
900-508140-PRD-001	Pressure Boundary	5507946	PN
CRL-508140-PRO-002	Classification and Design Registration of Pressure Retaining Systems/Components	5507949	NT
CRL-508140-QAP-001	CRL Pressure Boundary Quality Assurance	5507949	NT

	Authorized Inspection Agency Services Agreement between Technical Standards and Safety Authority and Canadian Nuclear Laboratories Limited	5507949	NT ¹
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¹ Termination of the agreement is considered a change that requires prior notification to CNSC.

Pressure Boundary Program

Where CSA standard N285.0 requires items to be submitted to CNSC for approval before implementation, the licensee shall: (a) document the item in sufficient detail to ensure it is safe to proceed; and (b) submit the item to AIA for assessment and acceptance (if required by CSA standard N285.0 or its referenced publications). The licensee may implement that item and notify CNSC staff if the AIA has given its acceptance.

Licensee documents describing the classification, registration and reconciliation processes and the associated controls are considered part of the pressure boundary program.

Formal Agreement with an Authorized Inspection Agency

The licensee shall have in place a formal agreement with an AIA acceptable to the CNSC to provide services for the pressure boundaries of the nuclear facility as defined by CSA standard N285.0 and its applicable referenced publications.

The licensee shall always have a valid AIA agreement, and shall adhere to the following:

- (a) The licensee shall arrange for the AIA inspectors to have access to all areas of the CRL's facilities and records, and to the facilities and records of the CRL's pressure boundary contractors and material organizations, as necessary for the purposes of performing inspections and other activities required by the standards;
- (b) The licensee shall provide the inspectors of the AIA with: information, reasonable advance notice and time necessary to plan and perform inspections and other activities required by the standards;
- (c) Where a variance or deviation from the standard exists, the licensee shall submit the proposed resolution to the AIA for evaluation; and
- (d) Design registration services shall be provided by an AIA legally entitled under the applicable provincial boilers and pressure vessels acts and regulations to register designs in the province of installation.

The licensee shall obtain AIA acceptance for implementation of the licensee's programs and procedures for:

- (a) calibration, repair and maintenance of overpressure protection devices;
- (b) repair and maintenance of mechanical joints; and
- (c) periodic inspection of boilers and pressure vessels designed according to CSA standard B51.

Guidance:

Guidance Documents

Document Number	Document Title	Version
CSA N285.0.1	Commentary on CSA N285.0-12, General requirements for pressure-retaining systems and components in CANDU nuclear power plants	2016

SCA – FITNESS FOR SERVICE

Licence Condition 6.1: Fitness for Service Program

The licensee shall implement and maintain a fitness for service program.

Preamble:

The *Class I Nuclear Facilities Regulations* requires that a licence application contain the proposed measures, policies, methods and procedures to maintain the nuclear facility.

CSA standard N291 specifies requirements for the material, analysis and design, construction, fabrication, inspection, examination, and aging management of safety-related structures for nuclear power plants. Safety-related structures covered in this standard are: a) structures that support, house, or protect nuclear safety systems; b) components of structures that are required for the safe operation and/or safe shutdown of the reactor; c) structures for the storage of wet and dry irradiated fuel; and d) structures for the storage of radioactive waste material.

CSA standard N287.8 provides aging management requirements for concrete containment structures and their components for nuclear power plants. This standard may provide guidance for aging management of other concrete structures where applicable.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.6.3	Aging Management	2014	April 1, 2018
CSA N291	Requirements for Safety-Related Structures for CANDU Nuclear Power Plants	2015	April 1, 2018

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
900-508230-PDD-001	Maintenance and Work Management	5507946	NT
900-508230-PRD-001	Maintenance and Work Management	5507946	PN
900-508230-PDD-002	Equipment Reliability	5507946	NT
900-508230-PRD-002	Equipment Reliability	5507946	PN

Guidance:

Guidance Documents

Document Number	Document Title	Version
REGDOC-2.6.2	Maintenance Programs for Nuclear Power Plants	2017
CSA N287.8	Aging Management for concrete containment structures for nuclear power plants	2015

SCA – RADIATION PROTECTION

Licence Condition 7.1 : Radiation Protection Program

The licensee shall implement and maintain a radiation protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within seven days.

Preamble:

The *Radiation Protection Regulations* requires that the licensee implement a radiation protection program and also ascertain and record doses for each person who performs any duties in connection with any activity that is authorized by the NSCA or is present at a place where that activity is carried out. This program must ensure that doses to workers do not exceed prescribed dose limits and are kept as low as reasonably achievable (ALARA), social and economic factors being taken into account. Also, the program ensures that occupational exposures are ascertained and recorded in accordance with the *Radiation Protection Regulations* through the establishment of dosimetry requirements.

The regulatory dose limits to workers and the public are explicitly provided in the *Radiation Protection Regulations*. The *Radiation Protection Regulations* also specify the requirements related to action levels (ALs) and indicate that the licence will be used to identify their notification timeframes. ALs relate to the parameters of dose to workers.

Action levels (ALs) are designed to alert licensees before regulatory dose limits are reached. By definition, if an action level is reached, a loss of control of some part of the associated radiation protection program may have occurred, and specific action is required as defined in the *Radiation Protection Regulations* and the licence. ALs are not intended to be static and are to reflect operating conditions at the CRL site.

Compliance Verification Criteria:

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
900-508740-PDD-001	Radiation Protection Program Description Document	5507946	NT
900-508740-PRD-001	Radiation Protection Program Requirements Document	5507946	PN
900-508740-MCP-006	Action Levels for Internal and External Exposures	5507946	PN
900-508740-MCP-007	Dose Control Points	5507946	PN
900-508740-MCP-026	ALARA Review and Assessment - Planning and Control of Radiation Work	5507946	PN
CW-508740-REQ-112	Contamination Limits	5507946	PN
CW-508740-REQ-114	Radiation Protection Consideration During Design and Modifications	5507946	PN

ALs for radiation protection are included in table 7-1. In the event of a discrepancy between the table and the licensee documentation upon which they are based, the licensee documentation shall be considered the authoritative source considering that the licensee has followed its own change control process.

Table 7-1: CRL Action Levels

Type of Dose	Action Level	
	mSv (rem) per four week or longer monitoring period ^[1]	mSv (rem) per year
Effective Dose	6 (0.6) ^[2]	20 (2)
Shallow Dose	100 (10)	200 (20)
Extremity Dose ^[3]	100 (10)	N/A
Internal Contamination	0.05 x ALI ^[4]	
Localized area of the skin due to a single skin contamination incident ^[3, 5]	50 (5)	

Notes:

1. The monitoring period is normally four weeks, but may be longer if justified. The monitoring period shall not exceed 3 months.
2. Action levels for pregnant women shall be 0.3 mSv (0.03 rem) per four weeks to the abdomen.
3. Extremity dose action level applies in situations where an extremity TLD has measured a dose exceeding 100 mSv. All contamination events that result in a dose to the skin, irrespective of the location on the body of the exposed skin, will be recorded and reported as appropriate as a skin dose (with the associated action level being 50 mSv).
4. The Annual Limit of Intake (ALI) is defined as the activity of a radionuclide that, when taken into the body, will deliver an effective dose of 20 mSv over the next 50 years following the intake.
5. The averaging area shall never be less than 1 cm², even in case of hot particles. When skin is unevenly irradiated, the equivalent dose received by the skin is the average equivalent dose over the 1 cm² area that received the highest equivalent dose. When the contamination is relatively uniform over the skin, the averaging area of 100 cm² may be used for operational convenience but not if significantly lowers the average dose.

Guidance:

Guidance Documents

Document Number	Document Title	Version
G-129, Rev. 1	Keeping Radiation Exposures and Doses “As Low as Reasonably Achievable (ALARA)”	2004
G-228	Developing and Using Action Levels	2001

The licensee should conduct a documented review and, if necessary, revise the ALs at least once every five years in order to validate their effectiveness. The results of such reviews should be provided to CNSC staff.

SCA – CONVENTIONAL HEALTH AND SAFETY

Licence Condition 8.1: Conventional Health and Safety Program

The licensee shall implement and maintain a conventional health and safety program.

Preamble:

The *Class I Nuclear Facilities Regulations* requires that a licence application contain the proposed worker health and safety policies and procedures.

As a federal regulated site, CRL is also subject to the requirements of *Canada Labour Code* and *Canada Occupational Health and Safety Regulations*.

Compliance Verification Criteria:

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
900-510400-PDD-001	Occupational Safety and Health	5507946	NT
900-510400-PRD-001	Occupational Safety and Health	5507946	PN

The Ministry of Labour is mandated with overseeing and enforcing compliance with the *Canada Labour Code* and its regulations. CNSC staff monitor licensee compliance with its conventional health and safety program, and will take regulatory actions for any potential unsafe work practice situations.

Guidance:

None provided.

SCA – ENVIRONMENTAL PROTECTION

Licence Condition 9.1 : Environmental Protection Program

The licensee shall implement and maintain an environmental protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within seven days.

Preamble:

The *Class I Nuclear Facilities Regulations* requires that a licence application contain information related to environmental protection. The *General Nuclear Safety and Control Regulations* requires every licensee to take all reasonable precautions to protect the environment. The *Radiation Protection Regulations* prescribe the radiation dose limits for the general public of 1 mSv per calendar year.

CSA standard N288.1 provides guidelines for calculating derived release limits for radioactive material in airborne and liquid effluents for normal operation of nuclear facilities.

CSA standard N288.2 provides guidelines for calculating the radiological consequences to the public of a release of airborne radioactive material for nuclear reactor accidents. The standard proposes methods for modelling the consequences of accidents at nuclear reactors for safety assessment and real-time emergency response.

CSA standard N288.4 provides requirements for the design and implementation of an environmental monitoring program at nuclear facilities.

CSA standard N288.5 provides requirements for the design and implementation of an effluent monitoring program at nuclear facilities.

CSA standard N288.6 provides requirements for the performance and maintenance of an environmental risk assessment at nuclear facilities.

CSA standard N288.7 provides requirements for the design and implementation of a groundwater protection program at nuclear facilities.

CSA standard N288.8 provides requirements for establishing and implementing action levels at nuclear facilities.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.9.1	Environmental Principles, Assessments and Protection Measures, version 1.1	2017	Dec 31, 2020
N288.4	Environmental monitoring programs at Class I nuclear facilities and uranium mines and mills	2010 (R2015)	April 1, 2018
N288.5	Effluent monitoring programs at Class I nuclear facilities and uranium mines and mills	2011 (R2016)	April 1, 2018
N288.6	Environmental risk assessment at Class I nuclear facilities and uranium mines and mills	2012 (R2017)	April 1, 2018
N288.7	Groundwater protection programs at Class I nuclear facilities and uranium mines and mills	2015	Dec 31, 2020

Document Number	Document Title	Version	Effective Date
N288.8	Establishing and implementing action levels to control releases to the environment from nuclear facilities	2017	Dec 31, 2019

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
900-509200-PDD-001	Environmental Protection	5507946	NT
900-509200-PRD-001	Environmental Protection	5507946	PN
CRL-509200-PRO-712	Administrative Levels and Action Levels for CRL Air and Liquid Radioactive Effluents	5507949	NT
CRL-509200-RRD-001	Derived Release Limits (DRLs) for AECL's Chalk River Laboratories	5507949	NT
CRL-509200-OV-126	CRL Environmental Monitoring Program Framework	5507949	NT
CRL-509200-PLA-005	CRL Radioactive Environmental Monitoring Plan	5507949	NT
CRL-509200-PLA-002	CRL Non-Radioactive Environmental Monitoring Plan	5507949	NT
CRL-509200-PLA-003	CRL Non-Radioactive Effluent Verification Monitoring Plan	5507949	NT
CRL-509200-PLA-004	CRL Radioactive Effluent Verification Monitoring Plan	5507949	NT
CRL-509244-PRO-001	CRL's Non-Radioactive Effluent Limits	5507949	NT

The licensee shall control, monitor and record releases of radioactive and/or hazardous substances such that the releases do not exceed the reference levels (limits) specified in tables 9-1, 9-2 and 9-3.

The dose to the critical group due to the sum of all radioactive releases in any period of 12 consecutive months shall not exceed 0.3 mSv.

Action levels for environmental releases are included in tables 9-4 and 9-5. These action levels are for the release paths and radionuclides or radionuclides groups which account for more than 0.1% of the derived release limits.

The licensee shall implement all follow-up actions identified as a result of environmental assessments, and shall report the progress to CNSC staff on an annual basis.

Table 9-1: Annual Release Limits for the Releases of Radioactive Substances to the Environment from Chalk River Laboratories

Release Path	Radionuclide	Release Limit ^(a) (Bq/year)
Airborne Releases		
NRU Stack	Argon-41	6.60E+16
NRU Stack	Carbon-14	2.14E+15

Release Path	Radionuclide	Release Limit ^(a) (Bq/year)
NRU Stack, NRU Vents, MPF Stack, WMA B Tile Holes	Iodine-131	3.96E+12
NRU Stack, NRU Vents, WTC Vents	Tritium Oxide	1.25E+16
MPF Stack	Mixed Noble Gases ^(b)	4.96E+16
WMA B Tile Holes Cemented Molybdenum Waste	Xe-133	8.35E+17
Liquid Releases		
Process Outfall, Storm Outfall 4F6, Duke Stream Weir	Tritium Oxide	1.03E+17
Process Outfall	Gross Alpha	1.32E+12
Process Outfall, Perch Creek Weir	Gross Beta ^(c)	2.70E+13

^(a)The sum of releases from all release paths for a given radionuclide shall be compared to the release limit (based on dose constraint of 0.3 mSv per year). These limits are based on the licensing basis for NRU operation and Mo-99 production.

^(b)The releases of mixed noble gases are measured in BqMeV.

^(c)Gross Beta for liquid releases includes Sr-90 and other radionuclides, predominantly short-lived activation products such as Zn-65, Ru-106, Ba-140, Fe-59, Sc-46, Ce-143, Np-239 and Nb-95.

Table 9-2: Annual Reporting Levels for Airborne Releases from Powerhouse Stack

Parameter	Annual Reporting Level (tonnes)
Carbon Monoxide (CO)	8.0
Nitrogen Oxides (NO _x)	75.0
Sulphur Dioxide (SO ₂)	315.0
Total Particulate Matter (TPM)	24.0
Particulate Matter < 10 µm (PM ₁₀)	21
Particulate Matter < 2.5 µm (PM _{2.5})	15
Volatile Organic Compound (VOC)	0.5

Note: Estimated data is used for assessment against these limits.

Table 9-3: Reference Levels (Limits) for Liquid Releases from Waste Treatment Centre Liquid Waste Evaporator (WTC_LWE) and Process Outfall

Parameter	Monitoring Point	Effluent Limits (Monthly Averages)
pH	Process Outfall	6-9
Total Phosphorus	WTC_LWE	1 mg/L
Total Suspended Solids	WTC_LWE	25 mg/L
Oil/Grease (Solvent Extractable Substances)	WTC_LWE	15 mg/L

Chromium	WTC_LWE	0.5 mg/L
Copper	WTC_LWE	0.5 mg/L
Lead	WTC_LWE	0.1 mg/L
Mercury	WTC_LWE	0.001 mg/L
Nickel	WTC_LWE	0.5 mg/L
Zinc	WTC_LWE	0.5 mg/L

Table 9-4: Action Levels for Airborne Effluents Released from CRL

Radionuclide	Facility	Release Path	Action Level (Bq/week)
Ar-41	NRU Reactor	Reactor Stack	6.35E+14
C-14	NRU Reactor	Reactor Stack	2.91E+11
Tritium Oxide	NRU Reactor	Reactor Stack	3.40E+13
I-131	NRU Reactor	Reactor Stack	1.24E+08
Tritium Oxide	NRU Reactor	Fan 12	3.51E+13
Tritium Oxide	NRU Reactor	Fan 15	5.14E+12
Tritium Oxide	NRU Reactor	Fan 24	8.63E+12
Tritium Oxide	NRU Reactor	Fan 39	1.78E+12
Tritium Oxide	NRU Reactor	Fan 71	7.56E+12
I-131	Mo-99 Production Facility	Mo-99 Stack	9.57E+08
Mixed Noble Gases*	Mo-99 Production Facility	Mo-99 Stack	3.17E+14
Tritium Oxide	Waste Treatment Centre	B574 Fan E2	2.17E+12

* For Mixed Noble Gases, the Action Levels are given in Bq.MeV/week.

Table 9-5: Action Levels for Liquid Effluents from CRL

Radionuclide	Release Path	Action Level (Bq/month)
Tritium Oxide	Process Outfall	2.18E+13
Tritium Oxide	4F6 Manhole	2.97E+13
Gross Alpha	Process Outfall	1.39E+09
Gross Beta	Process Outfall	3.07E+11
Gross Beta	Perch Creek Weir	4.98E+10
Tritium Oxide	Duke Stream Weir	2.53E+12
Tritium Oxide	Bulk Storage Stream	4.42E+12

Guidance:

Guidance Documents

Document Number	Document Title	Version
CSA N288.1	Guidelines for calculating derived release limits for radioactive material in airborne and liquid effluents for normal operation of nuclear facilities	2014 (Update 1)
CSA N288.2	Guidelines for calculating the radiological consequences to the public of a release of airborne radioactive material for nuclear reactor accidents	2014

SCA – EMERGENCY MANAGEMENT AND FIRE PROTECTION

Licence Condition 10.1: Emergency Preparedness Program

The licensee shall implement and maintain an emergency preparedness program.

Preamble:

This licence condition requires the licensee to establish an emergency preparedness program to prepare for, to respond to, and to recover from the effects of accidental radiological/nuclear and/or hazardous substance release. As part of the emergency preparedness program, the licensee establishes an onsite emergency response plan and an emergency response organization and makes arrangements for coordinating off-site activities and cooperating with external response organizations throughout all phases of an emergency.

The Class I *Nuclear* Facilities Regulations requires measures to prevent or mitigate the effects of accidental releases of nuclear substances and hazardous substances on the environment, the health and safety of persons and the maintenance of national security, including measures to assist, notify, report to off-site authorities including the testing of the implementation of these measures.

A security response to malevolent acts is governed by a separate plan under the Nuclear Security program (see LCH Section 12.1) but provisions of the licensee site security report apply to any associated potential threat of release of radioactive material - for example, the need for off-site notification, situation updates and confirmation of any radioactive releases.

Liquid release response and radioactive materials transportation emergency response plan are also governed by separate plans (See LCH Sections 9.1 and 14.1, respectively).

CRL has a communication program that covers a broad spectrum – community interface meetings, newsletters, websites, committees and various panels. Panels and committees that are a direct link between Emergency Preparedness and the community include: The Safety Review Committee, the provincial Nuclear Emergency Management Coordinating Committee and the local municipal/licensee Nuclear Emergency Preparedness Committee.

CRL provides the local municipalities and the province (as required, federal) with hazard information that can be used for community communications during an emergency.

CSA standard N1600 *General requirements for nuclear emergency management programs* establishes criteria for the emergency management programs of onsite and offsite organizations to address nuclear emergencies at Canadian reactor facilities.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.10.1	Nuclear Emergency Preparedness and Response, Version 2	2016	April 1, 2018

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
900-508730-PDD-001	Emergency Preparedness	5507946	NT
900-508730-PRD-001	Emergency Preparedness	5507946	PN

Document Number	Document Title	e-Doc	Notification
CRL-508730-ERP-001	Chalk River Laboratories Site Emergency Response Plan	5507949	NT

The requirements of REGDOC-2.10.1 related to nuclear reactors having a thermal power greater than 10MW apply to the NRU reactor only. All other requirements of REGDOC-2.10.1 shall be applied to CRL site as a whole, not to individual facilities on site.

Guidance:

Guidance Documents

Document Number	Document Title	Version
CSA N1600	General requirements for nuclear emergency management programs	2016
REGDOC 2.3.2	Accident Management, version 2	2015
	<i>Canadian Guidelines for Intervention During a Nuclear Emergency</i>	2003
	<i>Canadian Guidelines for the Restriction of Radioactively Contaminated Food and Water Following a Nuclear Emergency</i>	2000

Licence Condition 10.2: Fire Protection Program

The licensee shall implement and maintain a fire protection program.

Preamble:

Licensees require a comprehensive fire protection program (the set of planned, coordinated, controlled and documented activities) to ensure the licensed activities do not result in unreasonable risk to the health and safety of persons and to the environment due to fire and to ensure that the licensee is able to efficiently and effectively respond to emergency fire situations.

Fire protection provisions, including response, are required for the design, construction, commissioning, operation, and decommissioning of nuclear facilities, including structures, systems, and components (SSCs) that directly support the plant and the protected area. External events such as an aircraft crash or security threats are addressed in LCH Section 12.1.

The CSA standard N293 *Fire protection for nuclear power plants* provides the minimum fire protection requirements for the design, construction, commissioning, operation, and decommissioning of nuclear power plants, including SSCs that directly support the plant and the protected area. This standard has been used for the NRU reactor and will continue to be used until the reactor is defueled and dewatered.

The CSA standard N393 *Fire protection for facilities that process, handle, or store nuclear substances* provides the minimum fire protection requirements for the design, construction, commissioning, operation, and decommissioning of facilities which process, handle, or store nuclear substances, and other hazardous substances that directly relate to the nuclear substances being regulated.

The *National Fire Code of Canada* sets out technical provisions regulating (a) activities related to the construction, use or demolition of buildings and facilities; (b) the condition of specific elements of buildings and facilities; (c) the design or construction of specific elements of facilities related to certain hazards; and (d) protection measures for the current or intended use of buildings.

The *National Building Code of Canada* sets out technical provisions for the design and construction of new buildings. It also applies to the alteration, change of use and demolition of existing buildings.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
CSA N293	Fire protection for nuclear power plants	2007 (R2012)	April 1, 2018
CSA N393	Fire protection for facilities that process, handle, or store nuclear substances	2013 (R2016)	Dec 31, 2022
	<i>National Fire Code of Canada</i>	2015	April 1, 2018
	<i>National Building Code of Canada</i>	2015	April 1, 2018

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
900-508720-PDD-001	Fire Protection	5507946	NT

900-508720-PRD-001	Fire Protection	5507946	PN
CRL-508720-PRO-598	Impairment, Notification and Compensatory Measures	5507949	NT

A fire safe shutdown analysis for ZED-2 reactor is not required.

As required by CSA N293, the licensee shall ensure that a qualified third party performs a plant condition inspection annually. The resulting inspection shall be submitted to CNSC staff.

Where CSA standard N393 requires items to be submitted to CNSC for review and/or acceptance, the licensee shall document the item in sufficient detail to ensure it is safe to proceed. The licensee may implement that item without prior review and/or acceptance from CNSC staff. Changes of use or modifications for which the fire screening assessment indicates no potential impact on fire protection design basis, goals or criteria may not be subject to any further third-party review or require submission to the CNSC.

The licensee shall submit the results of third-party reviews required by CSA N393 (review of modifications, review of performance-based design or operation, fire protection program audit, and evaluation of fire response capability). The results of these reviews shall be submitted to CNSC staff no later than six months after the review together with any corrective action plans with compensatory measures for identified non-compliances.

Fire Response

In accordance with N393, the licensee shall arrange for third party audits of one industrial fire brigade fire drill once every two years. The purpose of a Third Party Audit is to provide an in-depth analysis of the Industrial Fire Brigade (IFB) fire response performance against applicable regulatory criteria. A fire response is a planned, coordinated and controlled activity to provide emergency response to a fire. The audit is to analyze and ensure competencies of the IFB against CSA N393 standard and the referred NFPA 600 and 1081 standards.

An independent third party auditor is required to be an expert in the discipline, normally firefighting and qualified through specific education and relevant experience. The third party auditor is required to be independent or at “arm’s length” from the facility to ensure impartiality. The review shall be of sufficient depth and detail to allow the reviewer to attest with reasonable confidence on the competencies of the IFB at the facility.

Guidance:

Where CSA N293 or N393 does not address a fire protection topic or issue in whole, or where additional guidance is beneficial, the standards and recommended practices set out by the NFPA are used as guidance by CNSC staff in determining the adequacy of a fire protection measure. The results of the Third Party Audit report will typically consist of a report which compares the requirements of the applicable codes and standards against the implementation of the fire protection program or the Fire Response exercised (based on the scope of the audit). The report should identify any non-compliance and formulate a conclusion on whether the licensee fire protection program or IFB meets the requirements of N393.

SCA – WASTE MANAGEMENT

Licence Condition 11.1: Waste Management Program

The licensee shall implement and maintain a waste management program.

Preamble:

The scope of this licence condition covers internal waste-related programs that form part of the CRL operations.

The *General Nuclear Safety and Control Regulations* require that a licence application contain information related to the management of radioactive waste or hazardous waste resulting from the licensed activities.

The *Class I Nuclear Facilities Regulations* require that a licence application contain the proposed procedures for handling, storing, loading and transporting nuclear substances and hazardous substances. CSA standard N292.0 specifies common requirements for the management of radioactive waste and irradiated fuel from generation to storage or disposal.

CSA standard N292.1 specifies requirements for the wet storage of irradiated fuel and other radioactive materials requiring shielding or decay heat dissipation.

CSA standard N292.2 specifies requirements for the site selection, design, construction, commissioning, operation, and planning for decommissioning of dry storage systems.

CSA standard N292.3 provides requirements specific to the management of low- and intermediate-level radioactive waste in solid, liquid, or gaseous states.

CSA standard N292.5 provides direction for the application of exemption quantity and clearance level criteria for the release of materials containing, or potentially containing, radioactive nuclear substances, and the activities necessary to demonstrate compliance with these criteria. Specifically, this standard addresses clearance of materials that are regulated by the NSCA and regulations made under NSCA.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
CSA N292.0	General principles for the management of radioactive waste and irradiated fuel	2014	April 1, 2018
CSA N292.1	Wet storage of irradiated fuel and other radioactive materials	2016	April 1, 2018
CSA N292.2	Interim dry storage of irradiated fuel	2013 (R2015)	April 1, 2018
CSA N292.3	Management of low- and intermediate-level radioactive waste	2014	April 1, 2018

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
900-508600-PDD-001	Waste Management	5507946	NT
900-508600-PRD-001	Waste Management	5507946	PN

Document Number	Document Title	e-Doc	Notification
CW-508600-PLA-002	CNL Integrated Waste Strategy	5507946	NT

The licensee shall not produce, in the course of the licensed activities, or accept from outside clients, waste for which there is no identified treatment, or storage, or disposal facility.

Guidance:

Guidance Documents

Document Number	Document Title	Version
G-320	Assessing the Long term Safety of Radioactive Waste Management	2006
CSA N292.5	Guideline for the exemption or clearance from regulatory control of materials that contain, or potentially contain, nuclear substances	2011 (R2016)

Licence Condition 11.2: Decommissioning Plan

The licensee shall maintain a decommissioning plan.

Preamble:

Class I Nuclear Facilities Regulations requires that a licence application contain the proposed plan for decommissioning of the nuclear facility or of the site. The decommissioning plan for CRL site is documented in the comprehensive preliminary decommissioning plan and the associated cost estimate. CSA standard N294 specifies requirements for the decommissioning of licensed facilities and other locations where nuclear substances are managed, possessed, or stored.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
CSA N294	Decommissioning of facilities containing nuclear substances	2009 (R2014)	April 1, 2018

Licensor Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
900-508300-PDD-001	Decommissioning and Demolition	5507946	NT
900-508300-PRD-001	Decommissioning and Demolition	5507946	PN
CPDP-508300-PDP-001	Comprehensive Preliminary Decommissioning Plan	5507949	NT
See e-Doc 5507949	Detailed Decommissioning Plans	5507949	NT

Facilities under Decommissioning

For Class I and Class II nuclear facilities at CRL, the licensee shall prepare detailed decommissioning plans (DDP) and procedures as needed, and submit the DDPs to CNSC staff.

For the decommissioning of radioisotope laboratories, storage rooms, contaminated buildings, support facilities, low-hazard nuclear structures and non-contaminated buildings, the licensee shall prepare facility/building clean-up (removal) plans, notify CNSC staff and submit the facility/building clean-up (removal) plans to CNSC staff.

Release from Regulatory Control

The licensee shall only release the decommissioned property, or any part thereof, for reuse upon the acceptance of the final end-state report by the CNSC.

Guidance:

Guidance Documents

Document Number	Document Title	Version
G-219	Decommissioning Planning for Licensed Activities	2000

Typical elements supporting decommissioning that may be included or referenced in the detailed decommissioning plan are: characterization survey; safety assessment; cost estimate; financial assurance; environmental impact assessment; environmental protection; radiation protection; quality assurance; waste management; emergency response; physical security; safe enclosure; site preparation; surveillance and maintenance; final survey; health and safety; personnel training; human factors.

SCA – SECURITY

Licence Condition 12.1: Security Program

The licensee shall implement and maintain a security program.

Preamble:

The *General Nuclear Safety and Control Regulations* require that a licence application contain information related to site access control and measures to prevent loss or illegal use, possession or removal of the nuclear substance, prescribed equipment or prescribed information.

The *Class I Nuclear Facilities Regulations* require that a licence application contain the proposed measures to prevent acts of sabotage or attempted sabotage at the nuclear facility.

The *Nuclear Security Regulations* require that a licence application contain specific information related to nuclear security, stipulates the requirements for high-security sites, and contains specific requirements pertaining to the transportation of Category I, II or III nuclear material.

The *Nuclear Security Regulations* require that a licensee of a high security site:

- maintain at all times a qualified onsite nuclear response force;
- obtain the applicable certifications, before issuing an authorization to a nuclear security officer;
- prevent and detect unauthorized entry into a protected area or inner area; and
- prevent unauthorized entry of weapons and explosive substances into a protected area or inner area.

The CSA standard N290.7 covers the cyber security of new and existing nuclear power plants (NPPs) and small reactor facilities.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.12.1 (prescribed information)	High-Security Sites, Volume I: Nuclear Response Force	2013	April 1, 2018
REGDOC-2.12.1 (prescribed information)	High-Security Facilities, Volume II: Criteria for Nuclear Security Systems and Devices	2018	April 1, 2018
REGDOC-2.12.2	Site Access Security Clearance	2013	April 1, 2018
REGDOC-2.12.3	Security of Nuclear Substances: Sealed Sources	2013	May 31, 2018
CSA N290.7	Cyber-security for nuclear power plants and small reactor facilities	2014 (R2015)	April 1, 2018

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
900-508710-PDD-001	Security	5507946	NT
900-508710-PRD-001	Security	5507946	PN
900-511400-PDD-001	Cyber Security	5507946	NT
900-511400-PRD-001	Cyber Security	5507946	PN
EPS-14000-RPT-17 (prescribed information)	Chalk River Laboratories Site Security Report	5507949	NT

The CNL document EPS-14000-RPT-17 *Chalk River Laboratories Site Security Report* document is required to be updated periodically and resubmitted to the CNSC staff. The site security report shall be updated and resubmitted when there are significant changes to the program.

Guidance:

Guidance Documents

Document Number	Document Title	Version
G-208	Transportation Security Plans for Category I, II or III Nuclear Material	2003
G-274	Security Programs for Category I or II Nuclear Material or Certain Nuclear Facilities	2003

SCA – SAFEGUARDS AND NON-PROLIFERATION

Licence Condition 13.1: Safeguards Program

The licensee shall implement and maintain a safeguards program.

Preamble:

Safeguards is a system of inspection and other verification activities undertaken by the International Atomic Energy Agency (IAEA) in order to evaluate a Member State's compliance with its obligations pursuant to its safeguards agreements with the IAEA. The requirements for reporting to the CNSC staff on the inventory and transfer of fissionable and fertile substances are included in subsection 3.2 of the LCH.

The *General Nuclear Safety and Control Regulations* requires the licensee to take all necessary measures to facilitate Canada's compliance with any applicable safeguards agreement.

The *Class I Nuclear Facilities Regulations* requires that a licence application contain information on the licensee's proposed measures to facilitate Canada's compliance with any applicable safeguards agreement.

Canada has entered into a safeguards agreement with the IAEA pursuant to its obligations under the Treaty on the Non-Proliferation of Nuclear Weapons. The objective of the Canada/IAEA Safeguards Agreement is for the IAEA to provide assurance on an annual basis to Canada and to the international community that all declared nuclear materials are in peaceful, non-explosive uses and that there is no indication of undeclared nuclear materials or activities. This conclusion confirms that Canada is in compliance with its obligations under the following Canada/IAEA Safeguards Agreement:

- [*Treaty on the Non-Proliferation of Nuclear Weapons*](#);
- [*Agreement Between the Government of Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons*](#); and
- [*Protocol Additional to the Agreement Between Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons*](#).

These are reproduced in information circulars INFCIRC/140, INFCIRC/164, and INFCIRC/164/Add. 1.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.13.1	Safeguards and Nuclear Material Accountancy	2018	April 1, 2018

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
900-508510-PDD-001	Nuclear Materials and Safeguards Management	5507946	NT
900-508510-PRD-001	Nuclear Materials and Safeguards Management	5507946	PN

The licensee shall obtain prior written approval of the CNSC, for any changes to operation, equipment or procedures requested by the licensee that would affect the implementation of safeguards measures.

Guidance:

None Provided.

SCA – PACKAGING AND TRANSPORT

Licence Condition 14.1: Packaging and Transport Program

The licensee shall implement and maintain a packaging and transport program.

Preamble:

The *Class I Nuclear Facilities Regulations* require that a licence application contain information on the proposed procedures for transporting nuclear substances and hazardous substances.

The transport of nuclear substances or hazardous substances must be done in accordance with the requirements of the *Packaging and Transport of Nuclear Substances Regulations, 2015*, (PTNSR) and *Transportation of Dangerous Goods Regulations* (TDGR) set out by Transport Canada.

IAEA document *SSR-6 Regulations for the Safe Transport of Radioactive Material (2012 Edition)* is incorporated by reference in PTNSR. These Regulations establish standards of safety which provide an acceptable level of control of the radiation, criticality and thermal hazards to persons, property and the environment that are associated with the transport of radioactive material.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
IAEA SSR-6	Regulations for the Safe Transport of Radioactive Material (2012 Edition)	2012	April 1, 2018

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
900-508520-PDD-001	Transportation of Dangerous Goods	5507946	NT
900-508520-PRD-001	Transportation of Dangerous Goods	5507946	PN

The licensee shall implement and maintain a packaging and transport program that will be in compliance with all the regulatory requirements set out in the Transport Canada TDGR and in the CNSC PTNSR.

Every person who transports or causes to be transported radioactive nuclear substances (included in Class 7 of the Schedule to the *Transportation of Dangerous Goods Act*) shall act in accordance with the requirements of the TDGR set out by Transport Canada.

As used in the PTNSR, the *IAEA Regulations* means the IAEA requirements document *SSR-6 Regulations for the Safe Transport of Radioactive Material (2012 Edition)* as amended from time to time.

The PTNSR provides specific requirements for the design of transport packages, the packaging, marking and labeling of packages and the handling and transport of nuclear substances.

Shipments of nuclear substances within the CRL site where access to the property is controlled are exempted from the application of the PTNSR.

Based on the current versions of the PTNSR and TDGR, for the packaging and transport of nuclear substances

- (a) to and from the CRL site, both PTNSR and TDGR apply.
- (b) between the CRL facilities:
 - according to paragraph 2(2)(d) of the PTNSR, the PTNSR do not apply to the transport of nuclear substances within the CRL site, except for sections 6 and 7. Sections 6 and 7 refer to

the CNSC *Nuclear Security Regulations*, specifically to the transport of Category I, II or III nuclear material.

- TDGR do not apply per subsection 1.25 of those regulations.

Guidance:

Guidance Documents

Document Number	Document Title	Version
RD-364	Joint Canada-United States Guide for Approval of Type B(U) and Fissile Material Transportation Packages	2009
REGDOC-2.14.1	Information Incorporated by Reference in Canada's Packaging and Transport of Nuclear Substances Regulations, 2015	2016

APPENDIX A: DEFINITIONS AND ACRONYMS

1. DEFINITIONS

The following is a list of definitions of words or expressions used in the LCH that may need clarification; they are defined for the purpose of the LCH only. All other terms and expressions used in the LCH are consistent with the definitions provided in the NSCA, the regulations made pursuant to the NSCA, or in the CNSC regulatory document REGDOC-3.6 *Glossary of CNSC Terminology*.

Approval – Commission’s permission to proceed, for situations or changes where the licensee would be:

- not compliant with a regulatory requirements set out in applicable laws and regulations;
- not compliant with a licence condition; and
- not in the safe direction but the objective of the licensing basis is met.

Boundary Conditions – procedural, administrative rules and operating limits for ensuring safe operation of the facility based on safety analyses and any applicable regulatory requirements.

Certified Staff – trained licensee staff, certified by the Commission as qualified to perform the duties of their respective roles.

Compliance Verification Criteria – regulatory criteria used by CNSC staff to verify compliance with the licence conditions.

Design Basis – the entire range of conditions for which the nuclear facility is designed, in accordance with established design criteria, and for which damage to the fuel and/or the release of radioactive material is kept within authorized limits.

Effective Date – the date that a given document becomes effective within the licensing period. The effective date is either set to the licence issue date or to a future date when the given document becomes effective.

Guidance – guidance in the LCH is non-mandatory information, including direction, on how to comply with the licence condition.

Important to Safety – items important to safety include, but are not limited to:

- (a) SSCs whose malfunction or failure could lead to undue radiation exposure of the facility/site personnel, or members of the public;
- (b) SSCs that prevent anticipated operational occurrences from leading to accident conditions;
- (c) those features that are provided to mitigate the consequences of malfunctions or failures of SSCs; and
- (d) tasks, duties, activities, aging mechanisms, findings, or any work that improperly performed could lead to radiation exposure of the facility/site personnel, or members of the public.

Program(s) – a documented group of planned activities, procedures, processes, standards and instructions coordinated to meet a specific purpose.

Qualified Staff – trained licensee staff, deemed competent and qualified to carry out tasks associated with their respective positions.

Safe Direction – changes in facility safety levels that would not result in:

- (a) a reduction in safety margins;
- (b) a breakdown of barrier;

- (c) an increase (in certain parameters) above accepted limits;
- (d) an increase in risk;
- (e) impairment(s) of safety systems;
- (f) an increase in the risk of radioactive releases or spills of hazardous substances;
- (g) injuries to workers or members of the public;
- (h) introduction of a new hazard;
- (i) reduction of the defence-in-depth provisions;
- (j) reducing the capability to control, cool and contain the reactor while retaining the adequacy thereof; or
- (k) causing hazards or risks different in nature or greater in probability or magnitude than those stated in the safety analysis of the nuclear facility.

Safety and Control Measures – measures or provisions which demonstrate that the applicant:

- (i) is qualified to carry on the licensed activities; and
- (ii) has made adequate provision for the protection of the environment, the health and safety of persons, the maintenance of national security and any measures required to implement international obligations to which Canada has agreed.

Written Notification – a physical or electronic communication between CNSC staff and a person authorized to act on behalf of the licensee.

2. ACRONYMS LIST

Acronym	Definition
ACC	Prior CNSC acceptance of change is required
AECL	Atomic Energy of Canada Limited
AIA	Authorized Inspection Agency
ALARA	As Low As Reasonably Achievable
ALI	Annual Limit of Intake
ASME	American Society of Mechanical Engineers
CAF	Change Approval Form
CNEA	Canadian National Energy Alliance
CNL	Canadian Nuclear Laboratories
CNSC	Canadian Nuclear Safety Commission
CRL	Chalk River Laboratories
CSA	Canadian Standards Association
DDP	Detailed Decommissioning Plan

Acronym	Definition
DG-DNCFR	Director General, Directorate of Nuclear Cycle and Facilities Regulations
EOP	Emergency Operating Procedures
IAEA	International Atomic Energy Agency
LCH	Licence Conditions Handbook
MAPLE	Multipurpose Applied Physics Lattice Experimental (reactor)
NPF	New Processing Facility
NRU	National Research Universal
NSCA	Nuclear Safety and Control Act
NT	Notification at time of making the change
PN	Prior Notification
PSA	Probabilistic Safety Assessment
PTNSR	Packaging and Transport of Nuclear Substances Regulations, 2015
SAMG	Severe Accident Management Guidelines
SMAGS	Shielded Modular Above Ground Storage
SSC	Structures, Systems, Components
SWS	Storage with Surveillance
TDGR	Transportation of Dangerous Goods Regulations
TLD	Thermoluminescent Dosimeter
USL	Upper Subcritical Limit
ZED	Zero Energy Deuterium